
SECTION 15419 - PLUMBING SUPPORTS, ANCHORS AND SEALS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Pipe hangers and supports.
 - 2. Sleeving for plumbing equipment and systems.
 - 3. Wall seals.

1.3 SUBMITTALS

- A. Submit shop drawings and product data in accordance with Section 01300 for the following items.
 - 1. Inserts.
 - 2. Hangers.
 - 3. Anchors and guides.
 - 4. Auxiliary framing.
 - 5. Wall seals.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Where not fully called for in the contract documents, design of hangers and supports shall be the Trade Contractor's responsibility. Design shall conform to accepted engineering practice, using a factor of safety of 2-1/2.
 - 1. Equipment supports shall be suitable for items supported, and dimensions and loads shall be verified from approved equipment shop drawings.
 - 2. Where feasible, hangers and supports shall be designed for installation without field welding.
 - 3. Steel members in areas of high humidity and where moisture can accumulate shall be galvanized steel.

4. Where not otherwise specified, shop- and field-fabricated hangers and supports shall be made of ASTM A 36 steel, finished with shop prime coat of one of the following paints:
- Material conforming to Fed. Spec. TT-P-86, Type I
Material conforming to Fed. Spec. TT-P-645
DuPont No. 771
Pratt & Lambert Noxite 90
Cadillac No. 158 Gray Primer
5. Except where fully detailed or specified, size and quantities of hanger rods for equipment shall be as specified by the equipment manufacturer.
- B. Auxiliary framing required to support building service equipment and lines (piping and similar systems) serving same, between structural frame members where direct support from structural frame members is not practicable, is included under this section.
1. For purposes of this paragraph, auxiliary framing is defined as framing other than that called for on the architectural or structural drawings.
- C. Except as specifically noted, non-symmetrical beam and joist hangers shall not be employed.
- D. Pipe and equipment hanger rods shall have 2 nuts at each end for positioning rod and hanger and for locking each in place.
- E. Clamps, rods, hangers, and other accessories on underground piping shall be bituminous coated.
- F. Hanger material and finish shall conform to following:
- | <u>Material of Supported Item</u> | <u>Hanger Finish</u> |
|-----------------------------------|----------------------|
| Copper | Copper-plated |
| Non-ferrous metal | Copper-plated |
| Insulation | Black steel |
- G. Hanger rod sizes and maximum safe loads for individual pipe shall be:

Rod Diameter	Safe Load
<u>In.</u>	<u>lb.</u>
3/8	610
2	1,130
5/8	1,810
3/4	2,710
7/8	3,770
1	4,960

2.2 ACCEPTABLE MANUFACTURERS

- A. Hangers for which figure numbers are listed herein shall be manufactured by Carpenter & Paterson, Elcen, Fee & Mason, or F&S Manufacturing Corporation. Except as otherwise noted, hanger and support figure numbers referred to are those of Carpenter & Paterson.
- B. Items of the same function and performance are acceptable if submitted and approved in conformance with Section 01300.

2.3 INSERTS

- A. Inserts shall have a malleable iron case with a galvanized steel shell and expander plug for threaded connection with a lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; Figure 650 for 1/4 inch through 5/8 inch rods and Figure 266 for 3/4 inch to 1 inch rods.
- B. Size inserts to suit the threaded hanger rods.

2.4 PIPE HANGERS AND SUPPORTS

- A. Hangers for pipe sizes 2 inch through 1-1/2 inches shall be adjustable wrought steel swivel ring band type with knurled nut and threaded, self-locking insert; Figure 800.
- B. Hangers for pipe sizes 2 inches through 5 inches shall be adjustable wrought steel clevis; Figure 100 or Figure 265 CVB with insulating saddle for insulated pipe.
- C. Wall support for pipe sizes to 3 inches shall be light welded steel bracket; Figure 69 or Figure 78.
- D. Wall support for pipe sizes 4 inches and over shall be welded steel bracket; Figure 84 or Figure 139.
- E. Vertical pipe support shall be steel riser clamp; Figure 126.
- F. Floor support for pipe sizes to 4 inches shall be a pipe saddle, as specified in Section 15250, steel; Figure 351, with Figure 64, locknut nipple, floor flange, Figure 185, and steel support, Figure 333.
- G. Design hangers to impede disengagement by movement of the supported pipe.

2.5 HANGER RODS

- A. Provide continuous threaded steel hanger rods.

2.6 SLEEVES

- A. Pipes shall be enclosed in Schedule 40 steel pipe sleeves where passing through masonry or concrete. Sleeve shall be properly anchored and sealed to the masonry or concrete, which shall be properly and neatly patched around sleeve if damaged.

1. The sleeve shall finish flush with the finished faces of the wall and partition, but shall finish one inch (25 mm) above the finished floor surface.
 2. The sleeve shall be two sizes larger than the pipe, insulated line, or other item passing through, where the least outside dimension of the item is no more than 4 inches (102 mm), and shall be one size larger where the least dimension is greater than 4 inches (102 mm), unless otherwise indicated on the drawings.
- B. In lieu of installing the sleeve in concrete and masonry, a neat, cored hole may be made.
- C. An exposed line which passes through a floor, ceiling, wall, or partition shall have a chrome escutcheon cover plate.
1. The escutcheon plate shall make a snug sliding fit with the penetrating item, and the outer edge shall completely cover the opening in the structure penetrated and any patchwork around the opening.
 2. Closures shall conform to all applicable codes and FM requirements.
 3. The escutcheon plate at the insulated line shall be sized to fit over the insulation, which shall be adequately protected from chafing damage at the plate. Insulation shall be carried through the sleeve with no reduction in insulation thickness.
 4. Each escutcheon plate at the floor shall cover the one-inch pipe sleeve extension above the finished floor.
 5. The escutcheon cover plate at metal siding shall be metal, matching the siding in material and gauge, and shall be painted to match. The paint shall be obtained from the siding manufacturer or erector, and shall match as closely as possible in material, appearance, and durability of the finish on the siding.
- D. In the exterior wall, the space between the pipe and the sleeve (the surface of the insulation and the sleeve, for insulated lines) shall be filled with as suitable non-combustible insulation, and the exterior face fully sealed against weather. The opening between the pipe and the wall shall be completely concealed, on both the inside and outside faces of the wall, by a neat cover or an escutcheon plate of non-corroding metal.
- E. Covers and escutcheon plates are not required where the pipe-wall joint will not be visible in completed work, except as required to retain the insulation in the annular space between the pipe and the sleeve.
- F. In interior partitions, walls, or floors, the space between the pipe and the sleeve shall be packed full with glass fiber insulation, held in place by a positive means, such as an escutcheon or a cover plate.
- G. At locations where the pipe which extends from inside a room, pit, trench, or similar space into an unexcavated space above the water table, an asphalt-base roofing cement shall be used to completely fill the space between the pipe and the sleeve.

- H. For pipes which extend from a dry area through a wall, floor, or roof into a wet area (i.e., where the pipe invert is at or below the water line or water table), or where vibration suppression is required between the pipe and the concrete element through which it passes, the pipe penetration shall be sealed with neoprene gaskets and compression flanges or similar approved devices, to ensure a watertight seal between the pipe and the wall, etc., surrounding the pipe.
1. "Linkseal" modular mechanical type interlocking synthetic rubber links, with pressure plates, bolts, and nuts are an acceptable watertight seal for the annular space between the pipe and the concrete opening. A sleeve shall not be employed between the pipe and the concrete when "Linkseal" is used as the seal.
- I. Penetrations through partitions, walls, and floors to accommodate pipe and other items shall not increase the sound transmission class (STC) of construction.

2.7 FLASHING

- A. Counter flashing at piping which pass through the roof shall be made with membrane type roofing material.
- B. Where a vent pipe termination is not more than 24 inch above the roof, a cylindrical flashing tube and flashing cap shall be included under another section of the specification. If necessary, shall trim the flashing tube to its proper length and reinstall the flashing cap after the vent installation.

PART 3 - EXECUTION

3.1 PIPE HANGERS AND SUPPORTS

- A. Support horizontal steel and copper piping as follows:

<u>Nominal Pipe Size (in.)</u>	<u>Distance Between Support (ft.)</u>
2	6
3/4 to 1-1/2	8
2 & 2-1/2	10
3 & larger	12

- B. Support horizontal cast iron (sanitary, waste and vent) piping at 5 feet intervals with at least one hanger adjacent to each joint.
- C. Install hangers to provide a minimum of 2-inch clear space between the finished covering and the adjacent work.
- D. Place a hanger within one foot of each change of direction and at concentrated loads of valves, strainers, and other accessories.

- E. Use hangers which are vertically adjustable 1-1/2 inches minimum after piping is erected.
- F. Support vertical piping at every other floor.
- G. Where several pipes can be installed in parallel and at the same elevation, provide multiple or trapeze hangers.
- H. Where practical, support riser piping independently from connected horizontal piping.
- I. Anchors and guides shall be located where indicated on the drawings and additionally where necessary to control the pipe direction and movement. Provide two guides on each side of expansion elements, with approximately 10 pipe diameters between guides.
- J. Total weight of hung pipe, conduit, equipment, ducts, etc., supported by one building element shall conform to the following:

<u>Building Element</u>	<u>Total Weight</u> <u>lb.</u>
Joist	600

- K. Supporting members shall not be fastened to the following:
 - 1. Joist web members, bridging, or bottom chord members;
 - 2. Joist top chord, except at panel points;
- L. Welding or burning of building structural members shall be performed only with prior written permission of the Engineer. Request for permission shall be accompanied by detailed shop drawing of the proposed hanger or support connection.

3.2 EQUIPMENT BASES AND SUPPORTS

- A. Provide reinforced concrete housekeeping bases poured directly on the structural floor slab, 4 inches thick minimum, extended 4 inches minimum beyond the machinery bedplates for new equipment. Provide templates, anchor bolts, and accessories required for mounting and anchoring the equipment. Concrete bases shall be provided for:
 - 1. Water heater
- B. Construct supports of structural steel members or steel pipe and fittings. Brace and fasten the supports with flanges bolted to the structure.

3.3 FLASHING

- A. Flash and counterflash where the mechanical equipment or systems pass through weather or waterproofed walls, floors, and roofs.

END OF SECTION 15419